

We claim:

1. In an electrodeposition bath, said electrodeposition bath comprising a resinous phase dispersed in an aqueous medium, said
5 resinous phase comprising:
 - (a) an active hydrogen-containing ionic electrodepositable resin, and
 - (b) a curing agent having functional groups reactive with the active hydrogens of (a),
10 the improvement comprising an electrodeposition bath containing at least one rare earth metal compound derived from a metal selected from magnesium, strontium, barium, and mixtures thereof, said compound present in an amount ranging from about 1 part per million to about 10,000 parts per million of total metal provided that not more than
15 about 1000 parts per million is in the form of soluble metal, based on electrodeposition bath weight.
2. The electrodeposition bath of claim 1, wherein said bath is essentially free of lead compounds.
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3. The electrodeposition bath of claim 1, wherein the amount of soluble metal present ranges between 5 and about 750 parts per million based on electrodeposition bath weight.
- 25 4. The electrodeposition bath of claim 1 wherein the amount of soluble metal present ranges between 5 and about 500 parts per million based on electrodeposition bath weight.
5. The electrodeposition bath of claim 1 wherein the amount of
30 total metal is not more than about 5,000 parts per million, based on electrodeposition weight.

6. The electrodeposition bath of claim 1 wherein the amount of total metal is not more than about 1,000 parts per million, based on electrodeposition weight.

5 7. The electrodeposition bath of claim 1 wherein said resinous phase further comprises at least one non-lead pigment.

8. The electrodeposition bath of claim 1, wherein said rare earth metal compound comprises a barium salt, a strontium salt and
10 mixtures thereof.

9. The electrodeposition bath of claim 1 wherein said rare earth metal compound comprises one or more barium salts.

15 10. The electrodeposition bath of claim 6 wherein said rare earth metal compound comprises barium nitrate.

11. The electrodeposition bath of claim 1, wherein said rare earth metal compound comprises one or more strontium salts.
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12. The electrodeposition bath of claim 1 wherein said active hydrogen containing ionic resin comprises cationic salt groups.

13. The electrodeposition bath of claim 1 wherein the amount of
25 soluble rare earth metal present ranges between 5 and about 100 parts per million soluble metal based on electrodeposition bath weight.

14. The electrodeposition bath of claim 1 wherein the soluble metal comprises barium which is present in an amount ranging from about
30 5 to about 100 parts per million soluble barium based on electrodeposition bath weight.

15. A method of electrocoating a conductive substrate serving as a charged electrode in an electrical circuit comprising said electrode and an oppositely charged counter electrode, said electrodes being immersed in an aqueous electrocoating composition, comprising passing
5 electric current between said electrodes to cause deposition of the electrocoating composition on the substrate as a substantially continuous film, the aqueous electrocoating composition comprising:

(a) an active hydrogen-containing ionic electrodepositable resin, and

10 (b) a curing agent having functional groups reactive with the active hydrogens of (a),

wherein the improvement comprises an electrodeposition bath containing at least one rare earth metal compound derived from a metal selected from magnesium, strontium, barium, and mixtures thereof,
15 wherein said compound is present in an amount ranging from about 1 part per million to about 10,000 parts per million of total metal provided that not more than about 1000 parts per million is present in the form of soluble metal, based on electrodeposition bath weight.

20 16. The method of claim 10 wherein the amount of soluble metal present ranges from about 5 to about 500 parts per million soluble metal, based on electrodeposition bath weight.

25 17. The method of claim 10, wherein the amount of soluble metal present in the bath ranges from about 5 to about 100 parts per million soluble metal based on electrodeposition bath weight.

30 18. The method of claim 10 wherein the amount of total metal is not more than about 5,000 parts per million, based on electrodeposition bath weight.

19. The method of claim 10 wherein the amount of total metal is not more than about 1,000 parts per million, based on electrodeposition bath weight.

5 20. The method of claim 10, wherein the electrodeposition bath is essentially free of lead compounds.

21. The method of claim 10 wherein said resinous phase further comprises at least one non-lead pigment.

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22. The method of claim 10 wherein said metal compound comprises a rare earth metal salt derived from a compound selected from barium salt, strontium salt and mixtures thereof.

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23. The method of claim 10 wherein said metal compound comprises barium nitrate.

24. The method of claim 10, wherein said metal compound comprises strontium nitrate.

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25. The method of claim 10 wherein the substrate serves as a cathode.

26. The method of claim 10 wherein said substrate is comprised of untreated steel.

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27. The method of claim 10 wherein said substrate is comprised of galvanized steel.

28. The method of claim 10 wherein said substrate is comprised of aluminum.

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29. The method of claim 10 wherein said substrate is comprised of a galvanized substrate.

30. The method of claim 10 wherein said substrate is comprised of a pre-phosphated electrogalvanized steel substrate.

31. The electrodeposition bath of claim 1, further comprising a bismuth compound.

32. The method of claim 15, wherein said electrodeposition bath further comprises a bismuth compound.